CLAIMS

1. A protein which has an amino acid sequence identical to or substantially identical to an amino acid sequence represented by SEQ ID NO: 5, or a salt thereof.

2. A protein which has an amino acid sequence identical to or substantially identical to an amino acid sequence represented by SEQ ID NO: 6, or a salt thereof.

3. The protein according to claim 1 or 2, which has PDZ domains and WW domains and is expressed specifically in the brain and has an ability to bind to activin receptors and/or activin intracellular information transmission molecules.

4. The protein according to claim 3, wherein the activin intracellular information transmission molecule is Smad3.

5. The protein according to claim 1 or 2, which has 5 PDZ domains and 2 WW domains and is expressed specifically in the brain and has an ability to bind to activin receptors and Smad3.

6. A partial peptide of the protein according to claim 1, a partial peptide of the protein according to claim 2, or a salt thereof.

7. A recombinant DNA which comprises a DNA having a nucleotide sequence encoding the protein according to claim 1 or the protein according to claim 2.

8. The DNA according to claim 7, which has a nucleotide

sequence represented by SEQ ID NO: 7, a nucleotide sequence represented by SEQ ID NO: 8 or a nucleotide sequence hybridizing therewith under high stringent conditions.

9. A recombinant DNA which comprises a DNA having a nucleotide sequence encoding the partial peptide according to claim 6.

10. A recombinant vector which comprises the DNA according to claim 7.

11. A transformant comprising the recombinant vector according to claim 10.

12. A method for producing the protein according to claim 1, the protein according to claim 2 or a salt thereof, which comprises culturing the transformant according to claim 11 to produce and accumulate the protein according to claim 1 or the protein according to claim 2 is formed and accumulated, and then recovering the product.

13. An antibody against the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof.

14. A method for quantifying the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof, which comprises allowing a test solution containing the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof and the

labeled protein according to claim 1, the labeled protein according to claim 2, the labeled partial peptide according to claim 6 or a labeled salt thereof to react competitively with the antibody according to claim 13.

15. A method for determining a binding protein to the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof, which comprises using the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof.

16. The method according to claim 15, which comprises introducing (1) an expression vector which fuses the protein according to claim 1, the protein according to claim 2 or the partial peptide according to claim 6 with a DNA-binding region of a transcriptional factor and (2) a fusion library between a gene encoding a test protein and a transcription-activating region, into a host cell having a reporter gene maintaining a region binding to the transcriptional factor on a promoter, and measuring a change in the amount of the expressed reporter gene which is increased by a binding of the protein according to claim 1, the protein according to claim 2 or the partial peptide according to claim 6 to the test compound.

17. A protein or a salt thereof which binds to the protein according to claim 1, the protein according to claim 2, the

partial peptide according to claim 6 or a salt thereof, which is obtained by the method according to claim 15.

18. A method for screening a compound or a salt thereof inhibiting or promoting a binding of the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof to the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, which comprises using the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof.

19. A method for screening a compound or a salt thereof inhibiting or promoting a binding of the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof to activin receptors or activin intracellular information transmission molecules, which comprises comparing the case where the labeled protein according to claim 1, the labeled protein according to claim 2, the labeled partial peptide according to claim 6 or a labeled salt thereof is contacted with activin receptors or activin intracellular information transmission molecules, with the case where the labeled protein according to claim 1, the labeled protein according to claim 2, the labeled partial peptide according to claim 6 or a labeled salt thereof and a test compound are

contacted with activin receptors or activin intracellular information transmission molecules, by measuring the amount of the labeled protein according to claim 1, the labeled protein according to claim 2, the labeled partial peptide according to claim 6 or a labeled salt thereof bound to the activin receptors or activin intracellular information transmission molecules in both the cases.

20. A method for screening a compound or a salt thereof inhibiting or promoting a binding of the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof to the protein according to claim 17 or a salt thereof, which comprises comparing the case where the labeled protein according to claim 1, the labeled protein according to claim 2, the labeled partial peptide according to claim 6 or a labeled salt thereof is contacted with the protein according to claim 17 or a salt thereof, with the case where the labeled protein according to claim 1, the labeled protein according to claim 2 or a labeled salt thereof and a test compound are contacted with the protein according to claim 17 or a salt thereof, by measuring the amount of the labeled protein according to claim 1, the labeled protein according to claim 2, the labeled partial peptide according to claim 6 or a labeled salt thereof bound to the protein according to claim 17 or a salt thereof in both the cases.

21. A method for screening a compound or a salt thereof inhibiting or promoting a binding of the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof to the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, which comprises comparing the case where the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof is introduced into cells expressing the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, with the case where the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof and a test compound are introduced into cells expressing the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, by measuring the amount of the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof bound to the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules in the cells in both the cases.

22. A method for screening a compound or a salt thereof

inhibiting or promoting a binding of the labeled protein according to claim 1, the labeled protein according to claim 2, the labeled partial peptide according to claim 6 or a labeled salt thereof to the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, which comprises comparing the case where the labeled protein according to claim 1, the labeled protein according to claim 2, the labeled partial peptide according to claim 6 or a labeled salt thereof is contacted with a membrane fraction of cells expressing the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, with the case where the labeled protein according to claim 1, the labeled protein according to claim 2, the labeled partial peptide according to claim 6 or a labeled salt thereof and a test compound are contacted with a membrane fraction of cells expressing the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, by measuring the amount of the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof bound to the membrane fraction of the cells in both the cases.

23. A method for screening a compound or a salt thereof

inhibiting or promoting a binding of the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof to the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, which comprises comparing the case where the protein according to claim 1, the protein according to claim 2, or a salt thereof is introduced into cells expressing the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, with the case where the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof and a test compound are introduced into cells expressing the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, by measuring the cell-stimulating activity via the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules in both the cases.

24. The method for determining a protein according to claim 16 or the screening method according to any one of claims 18 to 23, which comprises using the two-hybrid method.

25. A kit for screening a compound or a salt thereof

inhibiting or promoting a binding of the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof to the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, which comprises the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof.

26. A compound or a salt thereof which inhibits or promotes a binding of the protein according to claim 1, the protein according to claim 2, the partial peptide according to claim 6 or a salt thereof to the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, which is obtained by the screening method according to any one of claims 18 to 23 or by the screening kit according to claim 25.

27. A pharmaceutical composition comprising the protein according to claim 17, the compound according to claim 26 or a salt thereof.

28. The pharmaceutical composition according to claim 27, which is an agent for preventing or treating Alzheimer's disease, Parkinson's disease, epilepsy or Huntington's chorea.

29. A method for preventing and treating abnormalities in

nerve cells or cerebral diseases correlated with the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules, which administering an effective amount of the protein according to claim 17, the compound according to claim 26 or a salt thereof to mammals.

30. Use of the protein according to claim 17, the compound according to claim 26 or a salt thereof for preparing an agent for preventing and treating abnormalities in nerve cells or cerebral diseases correlated with the protein according to claim 17 or a salt thereof, activin receptors or activin intracellular information transmission molecules.